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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (ME) (Sem.-6)

MACHINE DESIGN-II

Subject Code : ME-302

M.Code : 59053

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**Q1. Write briefly :**

- a) In the context of wire rope, what 6×19 represents?
- b) What is nipping of leaf springs?
- c) What do you mean by simplex and duplex chains?
- d) What do you mean by de-energizing brake?
- e) Define module and pitch diameter of a gear.
- f) What is a 3D model in CAD represents?
- g) Define “coefficient of functional energy” for a flywheel.
- h) Give three usages of conical helical springs.
- i) Explain fast and loose pulley with neat sketch.
- j) What is the significance of sommerfeld number in sliding contact bearing?

SECTION-B

- Q2 Discuss various important factors on which a particular drive for power transmission depends?
- Q3 Discuss various types of stresses induced in a flywheel rim.
- Q4 Explain the basic theory and structure of CAD software.
- Q5 Give the complete general design procedure for flat belt drive along with pulley, shaft and keys.
- Q6 Explain in detail what are different failure modes of the gears?

SECTION-C

- Q7 Discuss and derive basic Lewis equation used in designing of gears.
- Q8 A single cylinder double acting steam engine develops 150 KW at a mean speed of 80 r.p.m. The coefficient of energy is 0.1 and the fluctuation of speed is $\pm 2\%$ of mean speed. If the mean diameter of the flywheel rim is 2 metre and the hub and spoke provide 5% of the rotational inertia of the flywheel, find the mass of the flywheel and cross-sectional area of the rim. Assume the density of the flywheel material (cast iron) as 7200kg/m^3 .
- Q9 How ball and roller bearing are designated and specify the conditions that suitably select one bearing amongst the ball, roller and needle bearing?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.